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40582 7590 08/28/2009

AIR LIQUIDE
Intellectual Property
2700 POST OAK BOULEVARD, SUITE 1800
HOUSTON, TX 77056

EXAMINER

HOPKINS, ROBERT A

ART UNIT

PAPER NUMBER

1797

DATE MAILED: 08/28/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,467

11/30/2006

Jerome Bres

SERIE 6302

3094

TITLE OF INVENTION: APPARATUS FOR THE SEPARATION OF AT LEAST ONE CONSTITUENT OF A GAS MIXTURE BY PRESSURE SWING ADSORPTION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/30/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

40582 7590 08/28/2009

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,467	11/30/2006	Jerome Bres	SERIE 6302	3094

TITLE OF INVENTION: APPARATUS FOR THE SEPARATION OF AT LEAST ONE CONSTITUENT OF A GAS MIXTURE BY PRESSURE SWING ADSORPTION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/30/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
HOPKINS, ROBERT A	1797	096-108000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/560,467	11/30/2006	Jerome Bres	SERIE 6302	3094
40582	7590	08/28/2009	EXAMINER	
AIR LIQUIDE Intellectual Property 2700 POST OAK BOULEVARD, SUITE 1800 HOUSTON, TX 77056			HOPKINS, ROBERT A	
			ART UNIT	PAPER NUMBER
			1797	
DATE MAILED: 08/28/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 576 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 576 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/560,467	BRES ET AL.	
	Examiner	Art Unit	
	Robert A. Hopkins	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 4-11-06.
2. ☒ The allowed claim(s) is/are 8,9, and 11-19(renumbered 1-11 respectively).
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>12-14-05</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
|---|--|

/Robert A Hopkins/
 Primary Examiner, Art Unit 1797

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In claim 14, insert a period --. -- after "zeolite".

Allowable Subject Matter

Claims 8,9,11-19 are allowed.

The following is an examiner's statement of reasons for allowance:

Claim 8 recites "a ballast; a generally horizontal flexible wall extending underneath the ballast; a skin extending underneath the upper dome over the ballast and resting upon the peripheral portions of the wall, the wall being pressed down against an upper end of the adsorbent mass by the weight of the ballast and skin; a volume between the flexible wall and the dome". Honda et al(6555385) and Ross et al(2008/0028933) teaches an apparatus for separating at least one component of a gas mixture by pressure swing adsorption comprising an upper dome, a bottom end, vertically extending walls, a first vertical chamber adapted and configured to receive the gas mixture, a second vertical chamber adapted and configured to collect a separated gas mixture, and at least one adsorbent mass separating the first and second vertical chambers. However Honda et al and Ross et al is silent as to a ballast; a generally

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horizontal flexible wall extending underneath the ballast; a skin extending underneath the upper dome over the ballast and resting upon the peripheral portions of the wall, the wall being pressed down against an upper end of the adsorbent mass by the weight of the ballast and skin; a volume between the flexible wall and the dome. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a ballast; a generally horizontal flexible wall extending underneath the ballast; a skin extending underneath the upper dome over the ballast and resting upon the peripheral portions of the wall, the wall being pressed down against an upper end of the adsorbent mass by the weight of the ballast and skin; a volume between the flexible wall and the dome because Honda et al and Ross et al does not suggest such a modification. Claims 9, and 11-14 depend on claim 8 and hence are also allowed.

Claim 15 recites "a generally horizontal flexible wall extending underneath the ballast; a means for pressing, the means for pressing being adapted and configured to press the wall down against an upper end of the adsorbent mass; a volume between the flexible wall and the dome, and a means for controlling pressure in fluid communication with the volume and being adapted and configured to control a pressure in the volume". Honda et al(6555385) and Ross et al(2008/0028933) teaches an apparatus for separating at least one component of a gas mixture by pressure swing adsorption comprising an upper dome, a bottom end, vertically extending walls, a first vertical chamber adapted and configured to receive the gas mixture, a second vertical chamber adapted and configured to collect a separated gas mixture, and at least one adsorbent mass separating the first and second vertical chambers. However Honda et al and

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Ross et al is silent as to a generally horizontal flexible wall extending underneath the ballast; a means for pressing, the means for pressing being adapted and configured to press the wall down against an upper end of the adsorbent mass; a volume between the flexible wall and the dome, and a means for controlling pressure in fluid communication with the volume and being adapted and configured to control a pressure in the volume. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a generally horizontal flexible wall extending underneath the ballast; a means for pressing, the means for pressing being adapted and configured to press the wall down against an upper end of the adsorbent mass; a volume between the flexible wall and the dome, and a means for controlling pressure in fluid communication with the volume and being adapted and configured to control a pressure in the volume because Honda et al and Ross et al does not suggest such a modification. Claim 16 depends on claim 15 and hence is also allowed.

Claim 17 recites "a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and an external line in fluid communication with said aperture and volume and said outlet line". Honda et al(6555385) and Ross et al(2008/0028933) teaches an apparatus for separating at least one component of a gas mixture by pressure swing adsorption comprising a generally vertical vessel comprising a bottom end, and upper dome and vessel walls extending between the bottom end and the dome thereby enclosing a space, the dome having an aperture therethrough, an annular

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perforated shell disposed in the space, the shell containing an adsorbent mass, outer portions of the shell and inner surfaces of the bottom end, upper dome, and vessel walls defining an outer chamber, an outlet line extending into the outlet chamber and being adapted and configured to collect gas separated by the adsorbent mass from the gas mixture to be separated, and a perforated central tube extending vertically through the shell defining an inner chamber and being adapted and configured to receive the gas mixture to be separated. However Honda et al and Ross et al is silent as to a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and an external line in fluid communication with said aperture and volume and said outlet line. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and an external line in fluid communication with said aperture and volume and said outlet line because Honda et al and Ross et al does not suggest such a modification.

Claim 18 recites "a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and a calibrated aperture formed in said horizontal wall thereby providing fluid communication between said inner chamber and said ballast material". "

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Honda et al(6555385) and Ross et al(2008/0028933) teaches an apparatus for separating at least one component of a gas mixture by pressure swing adsorption comprising a generally vertical vessel comprising a bottom end, and upper dome and vessel walls extending between the bottom end and the dome thereby enclosing a space, an annular perforated shell disposed in the space, the shell containing an adsorbent mass, outer portions of the shell and inner surfaces of the bottom end, upper dome, and vessel walls defining an outer chamber, an outlet line extending into the outlet chamber and being adapted and configured to collect gas separated by the adsorbent mass from the gas mixture to be separated, and a perforated central tube extending vertically through the shell defining an inner chamber and being adapted and configured to receive the gas mixture to be separated. Honda et al and Ross et al is silent as to a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and a calibrated aperture formed in said horizontal wall thereby providing fluid communication between said inner chamber and said ballast material. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume; a mass of solid ballast material resting upon said generally horizontal wall; and a calibrated aperture formed in said horizontal wall thereby providing fluid communication between said inner chamber and said ballast material because Honda

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et al and Ross et al does not suggest such a modification. Claim 19 depends on claim 18 and hence is also allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Thursday, 7:30am-5pm, every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rah
August 18, 2009

/Robert A Hopkins/
Primary Examiner, Art Unit 1797